Citizens' Bulletin

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The Connecticut Department of Environmental Protection

Environmental Education

Reaching out to the kids

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Cover Photo: Robert Paier; Environmental education specialist Alberto Mimo and New Britain second grader Frankie James.

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The Wider View

Environmental education: our highest priority

By George Russell,
Director of Staff Services, DEP

Can anything be more important than cleaning up the air, land, and water which has been polluted and despoiled throughout our nation? Thinking people would undoubtedly say that nothing should take precedence over a continuing, all-out effort to reverse the long-term trend toward environmental deterioration and to restore the wholesome quality which once prevailed in the world around us.

Unquestionably, cleanup and repair of environmental degradation is important, but such efforts are being directed at symptoms of an all-pervading problem and not at the malady itself -- which is people. People are the source and cause of most of the pollution which assails us on every front -- and especially those forms of pollution which are not readily recycled and rendered harmless by natural processes.

Mankind has relentlessly pursued the goal of dominion over the earth, carelessly manipulating its finite resources, exhausting the productivity of the soil, wasting our mineral and energy resources, loading our waters with noxious wastes, our air with foul, health-destroying contaminants, and our land with toxic and hazardous waste-substances. The inevitable result of irresponsible pursuit of short-term economic gains is the eventual destruction of our environment. This course must be abandoned and reversed if we are to survive on our small planet of limited resources.

Mankind has demonstrated that he has the capacity to manage wisely the resources which have been entrusted to his care without destroying them in the process. He must use this capacity to learn to live in harmony with his environment and to recognize that any other course will lead to destruction of the race and very possibly all life in our world. In the long run, therefore, prevention of environmental damage is the path of wisdom and promises to be the most productive and least expensive course.

For this clear and compelling reason, environmental education must have the highest priority in our efforts to protect our biosphere. It is absolutely essential to develop in every citizen an awareness and understanding of our environment, our indissoluble connection with it, and a sense of the responsibility which everyone must accept for learning to live in harmony with it.

Only when we are able to convince people that they are part of the problem, can we hope to gain their willing participation in finding a solution.

The answer, and the only answer, is development of a viable program for effective environmental education at the national level. ■

Mrs. Patricia Coyle's second grade class at Chamberlain Elementary School, New Britain, learns basic awareness from Alberto Mimo, environmental education specialist.

Toward the Environmentally Literate Citizen

Text and Photos by Robert Paier

"Only through environmental education can children and adults fully appreciate the complexity and sensitivity of the environment and the roles we must play to protect and preserve it," says Steve Fish, assistant director of the DEP's Information and Education Unit, Education Section. "In order to bring about long-term progress in environmental protection, it is essential that a coordinated program of environmental education be fully developed and maintained."

In the state of Connecticut, Steve Fish is one of many responsible for the development of environmental education. He and his staff develop the programs, teach the teachers, go out to the schools, and set up the mechanics of environmental education. In a wider sense, however, this is only one part of the state's efforts in environmental education. When a conservation officer insists that wildlife laws be obeyed and respected, that is environmental education. When a state forester explains how trees may be planted and harvested without disrupting the integrity of the land, that is environmental education. When many towns join together to build a resource recovery plant to handle solid waste, that is environmental education.

Environmental education is a major concern of the Department of Environmental Protection. There are, of course, many units within the DEP, several of which are involved in various methods of providing environmental education, such as through nature centers, lectures, and citizens' participation work. The efforts of the Education Section of the I and E Unit are unique, however, in that, in addition to the above activities, a major focus is on directly

"I believe environmental education is the key to long-term success with environmental problems."

Steve Fish

infusing environmental education into school curricula. This is done on a school-by-school, district-by-district basis, at the invitation of the schools involved. The popularity of the program is one measure of its success.

The Environmentally Literate Citizen

The goal of environmental education is the development of the environmentally literate citizen, someone who is not only competent to take action on issues critical to the protection of the environment, but is willing to do so. The willingness to act is the key here. Environmental education strives not only to change people's understanding and attitudes but, also, ultimately, their behavior.

Within the Environmental Education Section all programs involve a specific sequence of learning levels directed toward that goal.

The first level is awareness, a simple, direct confrontation with the natural world: "I see." The second level is appreciation, a sense of natural community, of compassion: "I care." The third level is understanding, a perception of the need for a correct response to the environment on the part of the individual: "I do." The fourth level is that of responsibility, in which all the other levels are drawn upon, in participation with other people, to take action for the benefit of all: "We do."

These four levels are a continuum, each leading to the next. The sequence may take place at many levels of sophistication, from a first grader's becoming aware of the intricacies of a leaf, to a 12th grader's gathering signatures to protest a hazardous waste dump. They all translate into a change of lifestyle. Through curriculum and individual activities at the appropriate level, the assimilation of these crucial concepts is brought about. The end result is the environmentally literate citizen, who is able to make competent decisions and to take effective action.

The Staff

Steve Fish has been the assistant director for education in the DEP's Information and Education Unit since 1978. He is a teacher and naturalist, with an M.S. in environmental education from Central Connecticut State University. He is widely experienced in all phases of environmental education, certified to teach kindergarten through 12th grade, and is president of the Connecticut Association of Environmental Educators. In 1980, he was chosen as Connecticut's Outstanding Environmental Educator.

Part of Fish's job involves supervising a state-wide program of curriculum design and implementation, staff development through in-service workshops, and the development of appropriate education programs covering DEP functions and actions.

Assisting Fish is biologist and teacher Alberto Mimo. A native of Venezuela, who has studied in Spain, Boston, and Connecticut, Mimo has taught science at elementary, secondary, and college levels. He is widely travelled and experienced, and gives the environmental education program an extra dimension with his language capability. Prior to assuming his present position in 1983, Mimo was the director of the Meigs Point Nature Center at Hammonasset Beach State Park for six years.

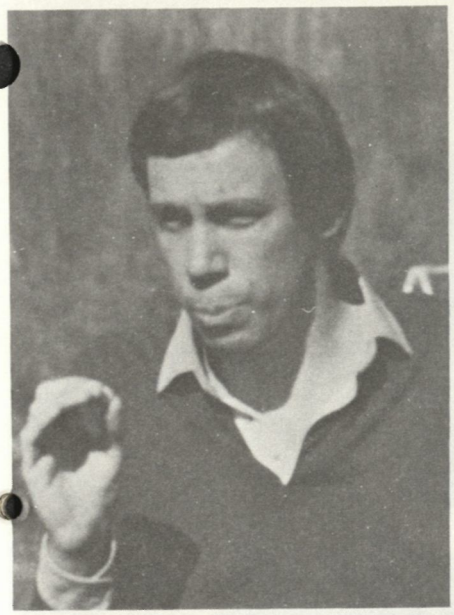
Martina Delaney has been with the Information and Education Unit since 1978, and she is primarily responsible for the student intern program. Delaney has an M.S. in environmental education from Southern Connecticut State University, and is certified to teach seventh to 12th grades. She has worked with local conservation and inland wetland commissions throughout Connecticut.

The newest member of the staff is Kathy Keith, a graduate of Trinity College, who specializes in environmental drama.

In-service Training: Teaching the Teachers

One of the responsibilities of DEP's Education Section is the coordination and implementation of in-service environmental education training for the elementary and secondary school teachers throughout the state. This program is designed to give teachers more expertise and confidence when teaching the fundamentals of environmental studies.

Recent studies indicate that elementary and secondary school teachers, in general, are concerned about environmental problems, and feel that they themselves, and certainly the schools, have the responsibility of infusing environmental awareness into the student curriculum. Also, it was found that teachers generally have a



Steve Fish, assistant director of I&E Unit.

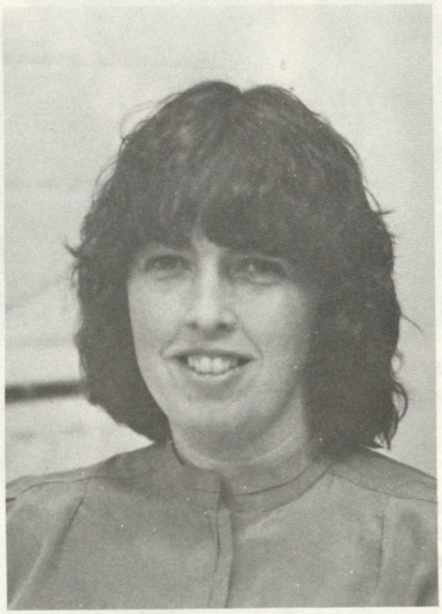
very clear comprehension of what environmental education is and what its goals are. The problem is that most teachers lack confidence in teaching environmental issues, and unless they have a specific scientific or social studies background, they tend not to initiate involvement in this area.

In some college programs, steps have been taken to alleviate this situation, by including the requirement of more biological and environmental studies at the pre-service stage. Another remedy, which has been an on-going project of the Education Section since 1979, has been a program of in-service training. Under the direction of Steve Fish, this program has reached out to teachers from kindergarten to 12th grade levels in a comprehensive, state-wide effort to enhance environmental awareness and confidence in teaching skills.

"Through direct contacts with individual teachers or school administrators," says Fish, "literally several hundred workshops have been given to teachers around the state. These workshops stress the development of basic skills and techniques as well as exposing teachers to selected curricula, such as Project Learning Tree, the CLASS Project, and our own Environmental Education Curriculum Guides."

Prior to any workshops, the curriculum currently used in a school system is reviewed. Environmental education activities are selected which not only meet the school's existing curriculum objectives, but which also link to specific environmental concepts. In other words, programs are tailored and packaged for each school system worked with.

"Follow-up in the classroom," Fish said, "is quite often a part of the service we provide. This allows a teacher to see firsthand the techniques, methods, and materials put to actual use."



Martina Delaney, coordinator of internship program.

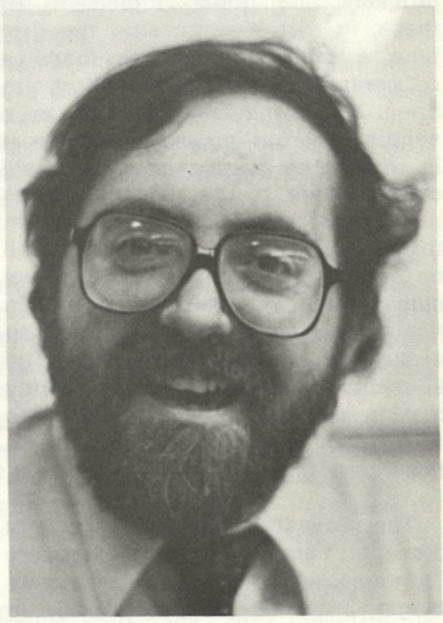
Direct Service, In-class Training: The Kids

"Our ultimate goal," said Fish, "is to work with school children so they can develop an awareness, appreciation, and understanding of our ecosystem. Sometimes unorthodox teaching methods are employed to drive home a point, whether it be about carrying capacity and habitat management or the development of an action plan to alleviate a hazardous waste problem."

The pleasant surprise with all this is that learning about the environment is enjoyable. All children, no matter what their feelings about the drudgery of schoolwork, enjoy taking a walk outside to look more closely at a tree, to smell twigs, to count tree rings, or to study the microscopic monsters that inhabit a drop of pond water. But, while the work is fun, a structured program is also being pursued, basic awareness is expanded, and the clear path toward environmental responsibility is followed.

At each grade level, the environmental educator presents a number of "competencies" at the appropriate level. These "competencies," or subject areas, are means by which the student develops an expanded awareness of the world, a sense of the interaction and interdependence of nature and humanity, and a growing sense of his own place in that system. (For a detailed presentation of these "competencies," please see "Environmental Education at a Glance," on page 12.)

Briefly, the competencies include: ecosystems, in which the student is taught how all forms of life are cyclic and mutually dependent; population, in which the population's impact on environment is examined; resources and energy, which examines what is a renewable resource and what is not; economics and technology, which examines the impact of those factors on the



Alberto Mimo, biologist and teacher.

environmental quality and public health; and environmental ethics, in which the student's role and responsibilities to the environment are examined.

Internship Program

A growing and popular program within the Education Section is the internship program, which is under the direction of Tina Delaney. This program is being developed in conjunction with a number of colleges in the area, and involves college students working within the DEP in a number of different capacities and gaining college credit for that work. In the past, interns have worked as nature interpreters, developed field guides, as well as having written and produced slide shows, and performed other valuable tasks for the department.

This program works well for everybody involved. Not only does the department get much needed help, but college students receive a priceless introduction to real field work.

Other Programs

In addition to the ongoing projects already described, the Education Section has several other programs which are both popular and educationally significant. The Urban Environmental Education Program is probably the most important of these, in that it represents the first time a state agency has made a concentrated, long-term effort to bring environmental education to a segment of our population where it is sometimes overlooked. The basic concept here is that not only does nature exist in rural areas, but also in the urban areas. In fact, it may well be much more important that we cultivate the awareness of nature in our urban areas, rather than focusing exclusively on the countryside. The Education Section is presently making a concerted effort within the New Britain public school system on this basis.

The Education Section regularly presents Family Outdoor Discovery Programs, which are series of events ranging from natural history walks in winter to salt marsh discovery hikes in summer. The basic concept underlying this program is that both children and adults retain more information when they are exposed to that information together.

Student McKeever McCoy: a direct confrontation with the natural world.

And finally, the Education Section provides a focal point for similar organizations, both public and private, throughout the state and provides a mechanism whereby the DEP is able to work cooperatively with these organizations.

The Long-Term Key

Environmental education touches everything that is done in the DEP. It draws upon all disciplines, from language and art to science and math. In order for children and adults to be able to make intelligent, responsible decisions on such issues as wildlife management, hazardous waste disposal, or the many other critical problems that we are faced with today, environmental education is a clear necessity.

"I believe education is the key to long-term success with environmental problems," says Steve Fish. "We are continuing to build a sound program that has taken some years to develop, and I am absolutely convinced this is the way to direct our efforts. I will not be happy until I see good environmental education throughout our state. It's a goal worth working for."

It's a goal that Steve Fish and many others have been pursuing for some time. Because of that, there are a few more environmentally literate citizens, and we all reap the benefit. ■

The longest worm in the world is called a ribbon worm, says National Wildlife's Ranger Rick magazine. Some ribbon worms grow to be 90 feet long -- which is longer than three school buses parked end to end.

Our Acrobatic Neighbor, the Squirrel

By Penni Sharp

Leonard Lee Rue III photos

The eastern gray squirrel is a handsome animal whose most distinctive feature is his broad bushy tail.

During January, Connecticut's residents will probably find several opportunities to go outdoors after a fresh snowfall and look for animal tracks. This has always been one of my favorite pursuits. For one thing, there is the pure beauty of a landscape dressed in new fallen snow; things look a lot less bleak. For another, it can be interesting to see what animals are abroad and to get some inkling as to what creatures dwell in one's backyard.

Sometimes, the imprints left in the snow tell an interesting story. For example, the tracks of a small mammal stop abruptly. Next to them is a mark that appears to have been made by the brush of a wing. Has a hawk or an owl swooped down upon some unsuspecting victim and carried it off for a meal?

Some of the animals whose tracks we follow are secretive or active only at night. These are seldom seen. Others are much more readily observed. A few birds and mammals have grown accustomed to our presence and are quite at home around our dwellings, particularly if food is available. One need only to glance out a window in order to watch these animals making tracks.

Of the many mammals in Connecticut, the gray squirrel is probably the best known. City and country dweller alike are acquainted

with this creature. The squirrel is likely to be the first wild animal to be noticed by young children. In fact, gray squirrels are so common, that I am sure that most of us pay scant attention to them. We are aware of their fondness for acorns and of their arboreal skills; however, what other facts do most of us know about this animal and its relatives?

Squirrels belong to the mammal family Sciuridae which is included in the order Rodentia, the gnawing mammals. The family is composed of marmots, woodchucks, ground squirrels, flying squirrels, prairie dogs and tree squirrels. Like all rodents, members of this family have large, curved incisor teeth, two above and two below. These four teeth grow throughout the life of the animal. There is a gap between these teeth and the grinding teeth.

Members of the squirrel family all have tails which are covered with hair and have four toes on the front feet and five on the back.

The eastern gray squirrel, Sciurus cardinensis, is a handsome animal whose most distinctive feature is its broad bushy tail. The tail, which plays an important role in the squirrel's maneuverability, is about half the size of the total length of the animal. Both male and female look alike and are generally gray in color. In summer, the coloration has shades of buff, whereas the winter fur tends to be silver-gray with the tail having long white-tipped hairs. There are several color phases of the gray squirrel, a black phase being the most common variation. Albinos and reds have also been noted.

Gray squirrels are found in deciduous forests and in mixed deciduous-coniferous forests where nut-producing trees occur. They are also at home in suburbs and city parks. Primarily arboreal, gray squirrels build nests in tree cavities and within tree branches. The latter are the bulky leaf nests which are quite visible in winter and are used for temporary shelter. The leaf nests are surprisingly sturdy, the outside consisting of tightly-woven twigs and leaves and the interior lined with soft material such as grasses, mosses, and ferns. The nest built within a tree cavity serves as a more permanent shelter and as a denning

Red squirrels are active throughout the year, are noisy, and often are heard rather than seen.

site. Gray squirrels mate in January and February, and 44 days later the naked, helpless young are born. A litter can number as many as nine, but two to three is the norm. The young squirrels remain in the nest until they are about six weeks old. By eight weeks, they are fully furred and ready to join the adults. The young stay with the female until the summer litter is born, usually in July. The female gray squirrel cares for her young and aggressively defends them from threats.

The gray squirrel spends most of its time among the tree tops, but will descend to feed. Anyone who has a squirrel population nearby and who puts out food for birds during winter knows that squirrels will feed on the ground. If startled, they can move with great speed and agility and leap for a considerable distance. Squirrels are also capable swimmers, and are able to cover distances of two miles or more. They remain active all winter, although during periods of extreme cold they tend to stay in the nest.

Gray squirrels are quite sociable and seem to coexist in harmony, although when food supplies dwindle, they may fight among themselves. They tend to spend their lives within the home range which averages an acre and a quarter in size. Migrations occur infrequently, but when they do, large numbers of squirrels may move long distances. The reasons for these large mass-migrations are not clearly known; however, over-population and limited food supply are suspected.

The gray squirrels feed on acorns, hickory nuts, beech nuts, walnuts,

and on the inner bark of some trees. Their diet also includes fruits, fungi, grains, and occasionally insects. They cache nuts, usually one at a time, throughout the woods. These hidden stores help them survive through the winter. Many a buried acorn is forgotten and some germinate and grow to be large trees. Thus, gray squirrels are important agents in reforestation.

A close relative of the gray squirrel, also found in Connecticut, is the red squirrel, Tamiasciurius hudsonicus. Red squirrels are quite a bit smaller than gray squirrels and their tails are not as bushy. In color, they are reddish-brown above and yellowish beneath. In summer, a black stripe extends along their sides between the reddish fur and the yellow underbelly. This stripe is usually absent in winter. During winter, red squirrels have prominent ear tufts and heavier coats.

Red squirrels are found primarily in coniferous woods. Like gray squirrels, they build nests among tree branches and also in tree cavities, often using deserted woodpecker holes. They usually bear two litters a year, one during early spring and another in late summer. Litter size averages four to five.

Red squirrels are active throughout the year and are daytime creatures, although they occasionally venture forth after dark. They are quite noisy, and often are heard rather than seen. A repeated "tcher-rrr, tcher-rrr" is one of their distinctive calls. Although tree-dwellers, red squirrels spend a good part of their time on the ground. At the northern limit of their range, where winters are snowbound, they remain under the snow for weeks at a time, moving through elaborate tunnel systems. The red squirrel is aptly named, Tamiass being a Greek word meaning "one who lays up stores." Sciurus is the Latin for squirrel and derives from the Greek words meaning "shadetail."

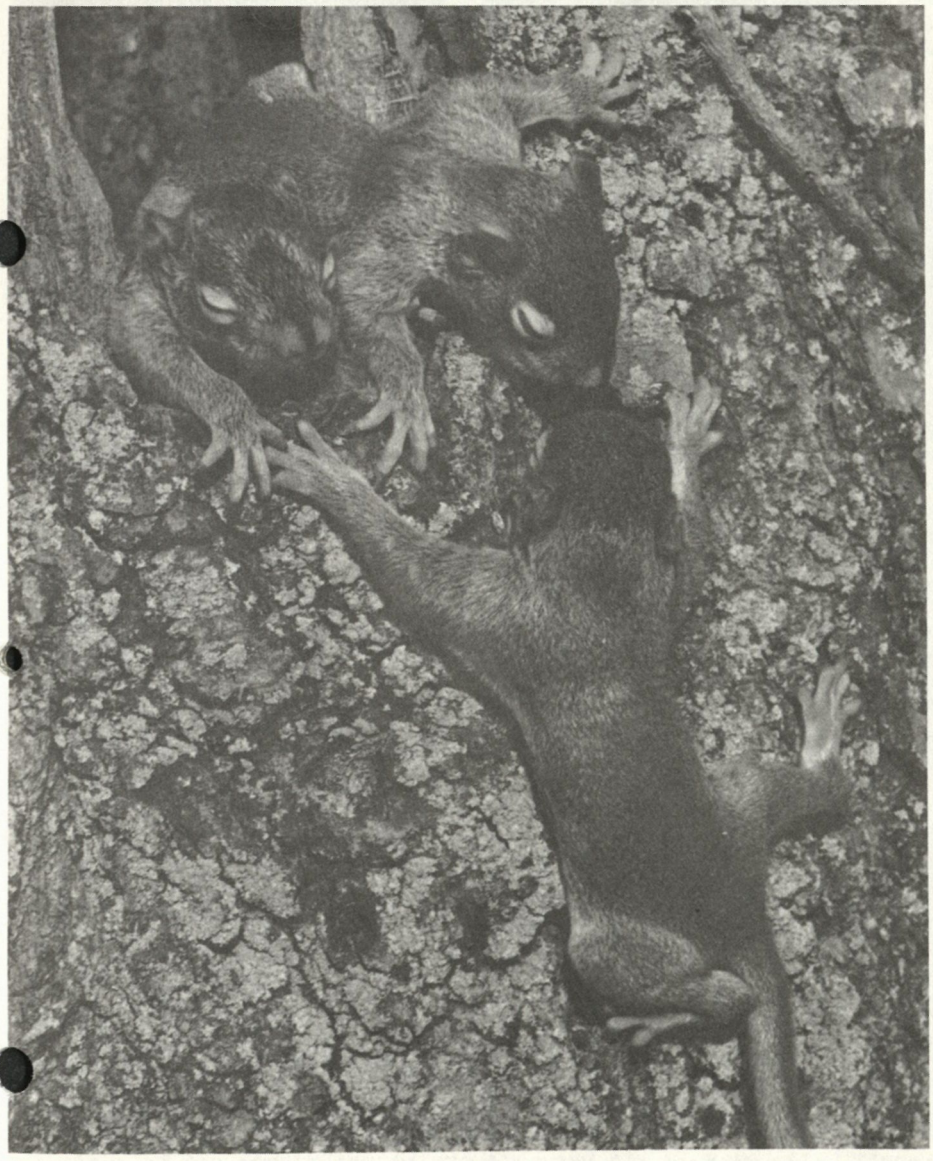
Red squirrels cache food underground in preparation for winter. These underground stores may contain as much as a bushel of food.

The red squirrels feed on a wide variety of nuts, seeds, buds, berries and fungi. They often use a tree stump as a feeding area leaving nut shells and seed husks piled on top. Red squirrels also consume insects, snails, and occasionally bird eggs. They are particularly fond of maple sap and in spring will often strip off tree bark in order to drink the flowing sap.

Red squirrels are not particularly sociable and are highly territorial. A squirrel will aggressively defend its winter food store and will scold any intruder to its territory.

Another small squirrel which inhabits Connecticut is the southern flying squirrel, Glaucomys volans. This squirrel is seldom seen due to the fact that it is nocturnal. Its soft, thick fur is olive-brown above and cream-colored below. A distinctive feature of the flying squirrel is the loose fold of skin that is found along each side of the body. When the animal leaps forward with limbs extended, these folds spread out, enabling the squirrel to glide for long distances. The broad, flat tail stabilizes the squirrel during its glides and also serves to direct its path. As do many nocturnal animals, the flying squirrel has proportionately large eyes which shine a reddish orange.

Southern flying squirrels inhabit deciduous forests, preferably mature woods with dead trees and snags. A nearby water supply is important to them as they drink frequently. Flying



Nine-day-old baby red squirrels: The average litter size is four to five.

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Harvest Holiday

A program of fun and education

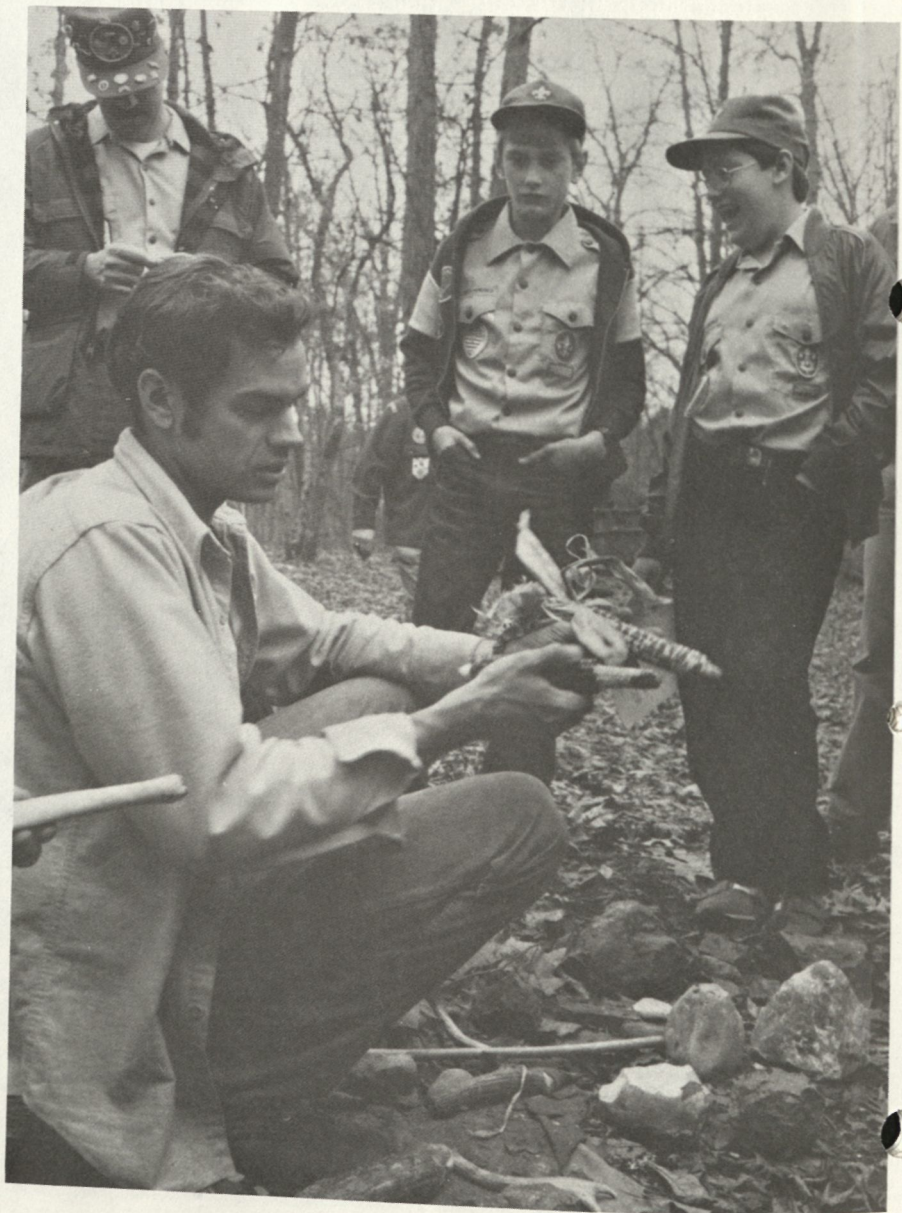
Text and Photos by Martha Kelley, Environmental Intern

On a chilly day in late October, the American Indian Archeological Institute (AIAI) was host to a Harvest Holiday, a day-long program of fun and education planned in cooperation with the DEP's Family Outdoor Discovery Program. The unique resources of AIAI, located in Washington, Connecticut, made possible an exciting exploration of the lifeways of the area's first peoples.

Dressed in authentic buckskins, Dr. Edmund Swigart, Chairman of AIAI, led a survival walk through the woods. Gradually he opened participants' eyes to the potential for food and shelter offered by the woodlands in fall or winter. Young and old were drawn into participation in the search for the neccessities of life, learning that shelter from the elements must be the first priority, followed by water and food. Snow must be melted before it will serve to quench thirst, so walkers watched for the birches, whose bark might be converted into a cooking vessel.

Soon even the city slickers in the group were searching among the leaves for the quartz stone that would give a spark with which to start a fire, or for the white oak acorns which might offer some sustenance.

Back at the AIAI's simulated Woodland Encampment Site, the technological ingenuity of the indigenous peoples came alive in demonstrations of basketry, finger-weaving, and toolmaking. Flintknapper Jeff Kalin kept a crowd of youngsters and adults enthralled



Jeff Kalin, authority on primitive technology, discusses Indian corn, a result of centuries of propagation.

with both his skill at producing razor-sharp stone implements and his running narrative on native technologies. As he described the superior properties of surgical instruments fashioned from obsidian, an onlooker could examine a chip of the stone -- cautiously.

A troop of boy scouts tested and approved the wigwams, traditional housing of area Indians. Several of the domed structures, constructed of saplings covered with bark or phragmites grass dot the Woodland Encampment Site. Once they had discovered this cozy haven, the scouts were noticeably disinclined to leave it.

The nippy air piqued appetites for the native foods offered. Downeast fry bread, a doughnut-like treat served with powdered sugar or honey, disappeared fast. The eyes of a two-year-old, twinkling over a cup of succotash, attested to his pleasure without interrupting his enjoyment of the food.

A dozen enthusiasts braved the evening chill to stay for a campfire and powwow. Their reward came in the form of the story-telling prowess of Tom Flanders and the warmth of participation in the Rabbit Dance.

If you regret that you missed this day of Family Outdoor Discovery, put January 26th on your calendar, for DEP has planned a program for the date, titled "Snowclothes, Snowshoes, Snowsnakes." Also to be held at AIAI's Washington facility, this program will feature a presentation on winter survival clothing, films on the Cree and Iroquois traditions of snowshoeing, and snowshoe treks for the beginning or experienced snowshoe trekker. To participate fully you will need snowshoes, a bag lunch, and plenty of warm clothing. For further information, contact AIAI at 868-0518, or DEP at:

Information and Education Unit
Room 112
165 Capitol Ave.
Hartford, CT 06106
566-5599

New snowshoes and bindings range in cost from $100 to $200; used, the cost may be reduced to about $50, but availability is limited. A few of the larger sporting goods stores offer rentals for up to $10 per day but, once again, supplies are limited, so it is important to make arrangements as soon as your plans are set. ■

Despite the Arctic's subzero temperatures, the polar bear's main problem is not keeping warm, but rather trying to stay cool while running over ice, says International Wildlife magazine. To prevent overheating, polar bears often jump into the sea or roll in the snow.

A troop of boy scouts tested and approved the wigwams, traditional housing of area Indians.

Resources and Energy

Depletion: Resources may be classified as renewable or non-renewable. All resources and energy are subject to depletion in both quantity and quality.

Management: Humanity, by the alteration of individual lifestyles, has the ability to influence the depletion rate of resources and energy. The base of renewable resources may be extended to decrease the depletion rate of energy and non-renewable resources.

Recycling: All life cycles involve recycling energy and materials. Human use of material involves very little recycling. Use and reuse of materials and energy in a society depends on the values of that society, and this determines the depletion rate of natural resources.

Distribution: A society's standard of living is determined by the availability of energy and resources. Energy and resources are distributed unequally among nations.

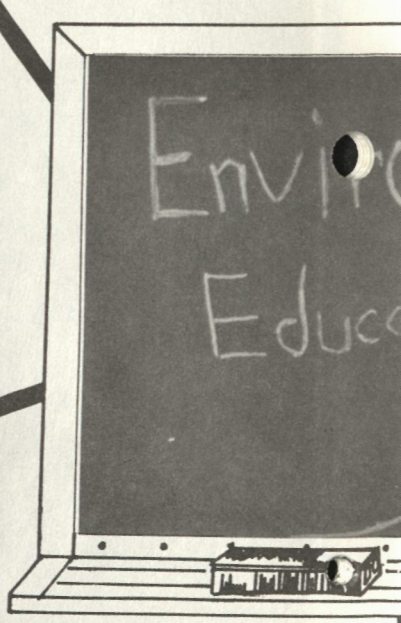
Conversion: The means a society employs to convert energy and resources into usable forms affect rates of depletion and, subsequently, environmental quality.

Economics &

Consumption: The impact a environment varies with the goods consumed.

Production: The metho of p also influences that society's

Interdependence: Societies the production of goods.



Population

Change: Birth and death rates determine the growth rates of a given population. Humankind has the ability to influence population growth rates.

Distribution: Human population density varies thoughout the world. It is unevenly distributed with respect to natural resources.

Structures: The age distribution within a population influences that population's impact on the environment.

Impact: Societies consume at different levels. A society's impact on the environment is the product of the population size, density, and consumption.

Environmental Qua

Values: Values concerning the env the society and are reflected in indiv

Health: Health is, to a large ex environmental factors. Improveme quality will improve public health.

Environmental Education at a Glance

Teaching the interaction between the natural and the man-made world.

Technology

given economy has on the type and quantity of the

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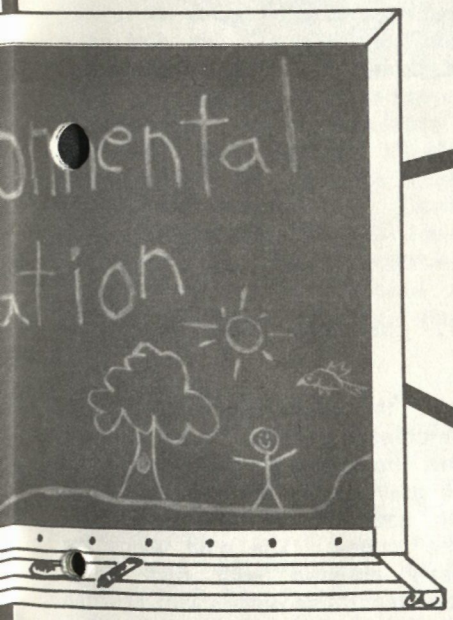
depend on one another for



Ecosystems

Cycles: Every living process is part of a biological cycle involving materials and energy. Human activities influence these natural cycles, upsetting existing balances.

Interdependence: All living organisms are dependent on each other and on the environment. Recognition of our dependence on natural cycles is necessary for our survival.

Limits: All forms of life depend on finite environmental resources to satisfy their life needs. Humans can alter the availability of those resources.

Change: Organisms and environments are in a constant state of change. Humanity may alter the rate and degree of these changes.

Environmental Ethics

Awareness: We must recognize ourselves and all beings as part of the biosphere.

Stewardship: We are here as protectors of the earth and not as exploiters of it.

Adaptation: We must be willing to change lifestyles to reduce environmental impact.

Responsibility: We must learn to assume active roles in the collective decision-making process in order to reduce the environmental impact of human activities.

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Lost, Stolen, or Astray

By Paul Godwin

Not reported in Connecticut since 1956, the regal moth is still a prize to be hunted.

The regal moth, Citheronia regalis, was never common in Connecticut. We are near the northern limits of the species' range, for whatever the reasons are that govern such things. When we began to use DDT on our forests in the late 1940s and early 1950s in order to control the gypsy moth, the regal moth disappeared. Apparently, it is extinct in Connecticut now. Most of our giant silk moths came close to suffering the same fate. The regal moth, of course, is not one of our giant silk moths (Saturniidae), although it is as large as they are and for that reason easily mistaken for one. Unlike cecropia, polyphemus, luna, io, and promethea moths (to name some of our Saturniids), the regal moth doesn't produce a lot of silk to make a large silken cocoon. Rather, it burrows into the ground to pupate in an earthen cell.

Citheronia regalis has two common names, one for the adult moth (regal) and one for the caterpillar (the hickory horned devil). Few would deny that the full grown caterpillar is, pound for pound, the most formidable looking animal in our woods (the drawing is about 1/2 full size). If the hickory horned devil were the size of a bear, its hide would hang with other prized trophies of the hunt, to vie with tusk of elephant, horn of ram, and rack of moose. But it isn't the size of a bear, and the woods do not ring to its trumpetings, nor do the hills echo to the crash of its horns. It is but a shy, silent, secretive caterpillar of the regal moth -- huge but harmless. Still, it is a prize to be hunted. The species has not been reported in Connecticut since 1956. If by some good fortune the species has returned, and you see it, conserve it, and let us hear about it.

Many hickory horned devils exceed 125 mm in length. They are green with a yellowish-brown head. On either side of each abdominal segment is a broad white band with a narrower black bar above it. But the features that really catch one's attention are the six reddish-brown, black-tipped, barbed horns that dominate the thorax. Few are prepared for an encounter with this thing. The caterpillars are likely to be seen during late summer. Besides hickory leaves, as the name implies, the caterpillars eat walnut, sycamore, sumac, and sassafrass leaves.

A regal moth may have a wing span of over 125 mm. On the front wings, the veins are covered with rust-colored scales. Between the veins, the scales are pale-umber, but look gray against the rust-red. Each wing has ten or more patches of white scales. The hind wings are mostly covered with rust-colored scales but these diffuse into pale-tan scales toward the front of the wing. On the head, thorax, and abdomen, rust-colored scales predominate, with tan scales forming bands and patches. No black and white line drawing can convey the subdued beauty of this moth. They fly from late May to August.

The Connecticut Entomological Society is making a list of rare and endangered insect species of Connecticut. The regal moth is not the only species missing. While looking for the regal, you might also look for the imperial moth -- it hasn't been reported in years. ■

Environmental Theater Program

Making information memorable

By Este Stifel, Environmental Intern

Playwright and teacher Kathy Keith, of DEP's Information and Education Unit, has been the guiding light behind the state's environmental theater program since the summer of 1983. As an environmental educator, she feels she has two objectives: 1) to present useful information about the environment; and 2) to make that information as memorable as possible. Environmental theater is founded on the principle that we learn best what we feel. Concepts are internalized through theater; emotions and sensory involvement cause concepts to become more deeply imprinted in the viewers' minds.

Keith's job consists of four main areas: 1) classroom workshops in drama; 2) staff training; 3) curriculum development; and 4) environmental theater, from initial concept to final presentation. In classroom workshops the focus is on active participation and creative dramatics. The students are the actors, using such techniques as group movements, characterization, mime, and story dramatization.

The second major area is a natural follow-up to classroom dramatics. It involves staff training in environmental theater methodology. During these workshops the stress is on the importance of theater as an educational tool. Curriculum development is used to keep the teachers involved throughout the year. New curriculum materials are designed and distributed to encourage teachers to make environmental theater an ongoing process in their classrooms.

Kathy Keith: "People remember when they have been actively involved."

The fourth area of concentration is environmental theater for the general public, with scripts appropriate to all age groups. These plays are enacted at specific locations, depending on the particular subject matter.

Because of the nature of 20th century society, it is necessary that education must be, first of all, entertaining. Unless this is the case, Keith feels, it will simply not command attention. Today's culture is a switch-it-on, switch-it-off culture, characterized by passive acceptance of input, and general demand for instant gratification. The use of drama, with an insistence on active audience involvement, is one way of responding to this problem. "People remember more when they have been actively involved," says Keith. "We try to pull that involvement out of the audience."

The process of script-writing is not easy. Keith must create a theme and follow it through with in-depth background research to ensure complete accuracy of information. Then she must design a story-line that will "grab" and involve the audience. To do this, she must create an appropriate situation that will be recognizable to the audience. She must create sympathetic, three-dimensional characters. And finally, for each character, she must create an accurate costume with various props.

The final production does not attempt to "answer questions" or "lecture." Instead, the aim is to stimulate thinking, and to take a fresh look at things which may have been taken for granted.

Keith has several long-range goals. She would like creative dramatics to become more widely accepted as part of standard environmental education, so that groups will call the DEP and request a specific performance or educational materials. She would like to show just how thoroughly learning can be drawn from within; the traditional type of education -- being lectured at -- is obsolete today, and she would like to see it replaced with these new methods. And, finally, she would like to see a greater stress on environmental education in general.

Keith summed it all up neatly when she said that she believes in "responsibility to the environment and responsibility to the kids." ■

Leonard Lee Rue III

The Wolf in Fact and Fiction

By Catey Sullivan, Environmental Intern

Scene: An old, wizened grandmother, a young girl dressed in a red cloak, a specialist on wolf behavior, an impartial commentator, and a comically ferocious wolf are assembled on the western side of Hartford's Bushnell Park. As the wolf bares his teeth and prepares to devour the girl in the red cloak, the wolf specialist protests sharply.

"Now just a minute," the specialist says. "In the whole history of our continent, there hasn't been one case -- not one -- of a wolf attacking and killing a human being!"

The wolf starts in surprise and scratches his shaggy head.

"I hate to rob you of your delicious, childish fears of wolves," the specialist continues, "but this is ridiculous." The wolf looks sheepish, and excuses himself. The commentator throws up his hands in disgust and tells the specialist he has just ruined a perfectly good fairy tale. The young girl in the cloak and the old grandmother look gratefully at the specialist, who is actually an environmental educator with the Department of Environmental Protection, as also are the wolf and the young girl.

Kathy Keith had called for the rehearsal of this much-modified production of Little Red Riding Hood in preparation for three performances of the play which the educational staff members performed in Chatfield Hollow State Park. Keith wrote the script to better educate park-goers as to realistic behavior of wolves. The play was performed three times, twice for the general public and once for a small group of retarded adults.

The timber wolf: in reality, a tragically endangered species.

Several interesting facts came to light in the course of Keith's script. For example, while wolves do not eat old women, they do tend to prey on the old and the sick of some species. Keith explained that this behavior actually strengthens those species preyed upon by the wolf, and makes the breeding stock stronger. Keith also pointed out that wolves are successful in catching their prey less than seven percent of the time.

The story of Little Red Riding Hood, in its original form, makes no mention of the location of the fabled forest in which the wolf encounters and then eats both the girl and her grandmother. Keith, through her play, informed viewers that it could only have taken place in Alaska or one of the upper Great Lake states, as these are the only two locations in the United States where wolves continue to survive. It was not so very long ago that wolves were more widely distributed than any other mammal in North America.

Keith's play was designed to direct the attention of its primarily juvenile audience to the plight of the vanishing wolf. The script emphasized that wolves have been "shot at from planes, chased by riffemen in snowmobiles, trapped, and poisoned," in addition to being "driven from Europe and . . . bountied in the United States."

In an effort to dispel old, commonly-held fears and prejudices about wolves, Keith wrote that these animals were about as angry and ferocious when eating as humans are when attacking a steak. The natural prey of a wolf is buffalo, caribou, and moose; the wolf will consume domestic livestock only when that is all that is available.

While the script was simple and geared toward children, its very serious point was made clearly. Keith's goal of distinguishing between the wicked wolves of fairy tales and the tragically endangered species of reality was accomplished. The production effectively drew the line between fact and fiction. ■

According to EPA's latest estimates, U.S. industry generates more than 300 gallons of toxic waste for every person in the country each year, says the National Wildlife Federation. All told, that adds up to 71 billion gallons of toxic waste. This is 60 percent higher than EPA's figures released last year.

Some 3,800 pieces of space-age junk, mostly pieces of old satellites and space probes, are currently orbiting the Earth, reports International Wildlife magazine. According to the North American Aerospace Defense Command (NORAD), among the six tons of debris is a white glove lost by astronaut Ed White.

Connecticut's Hazardous Wastes

A subject for concern

By Leslie Lewis, Citizen Participation Coordinator

The Connecticut Hazardous Waste Management Service was established in 1983 by Public Act 83-572. Established to promote and encourage the safe management of hazardous wastes in the state, the service is a quasi-public corporation accountable to the governor and the General Assembly. It is separate from both the Department of Environmental Protection and the Connecticut Siting Council.

At the present time the service is guided by a six-member Board of Directors chosen to represent business, academia, and the general public. Kathleen Golas of West Hartford is chairperson, with other directors being: Patricia Smith of Cheshire; George Holeman from Yale University; Wallace Pringle from Wesleyan University; Sumner Kaufman of Davis and Geck; and Robert Genereau from Stanley Plating Company. Each member has expertise in the area of hazardous waste management which should prove valuable as the service prepares to carry out its mandate.

The first major task confronting the service was to develop waste generation data and estimates for waste management needs to the year 2005. In order to determine this information, the consulting firm of ERM-Northeast has been contracted to conduct a hazardous waste management generation and analysis project. Information being developed includes accurate data on sources, types, and quantities of waste generated in Connecticut; current hazardous waste management practices; analysis of the economics of current and future waste management practices; and a data base system.

Once the consultant has collected the data, the service is required to develop a long-term plan for hazardous waste management. This involves identifying the need for appropriate management facilities and inventorying potential sites. The service will also encourage private industry to develop such facilities as are needed. No particular types of treatment or management techniques are being considered at this time, nor have any specific sites for facilities been designated.

While it is the intent of the Hazardous Waste Management Service that the private sector will develop waste management facilities it is empowered to fill that need if necessary. Under PA 83-572, if private developers do not build or increase treatment capacity in Connecticut, the Service is authorized to acquire, construct, and finance such facilities as may be needed. Should such a possibility arise, the siting and development would be regulated by the Connecticut Siting Council and the DEP.

There are obvious limitations to the amount of time six people can give to a major undertaking like the Service. To help meet their goals, the Board of Directors has set up several task forces which work on specific aspects of the hazardous waste management problem. One such task force recently completed a public information and participation plan for the Service. Another will review the data generated by the consultant. Others will be formed as new areas of need are identified.

The board members are most anxious that the public be kept informed of the service's activities. To this end, they have been holding a series of meetings around the state to develop awareness of the service's goals and its activities so far.

The last meeting will be in Hartford at the Morgan Street Holiday Inn, at 7:30 p.m., on January 21. Everyone who is interested is welcome and encouraged to attend.

How to manage Connecticut's hazardous wastes safely and efficiently should be a subject of concern to all citizens. The Hazardous Waste Management Service is just one player in a complicated game. While it has a definite mission, it cannot operate in a vacuum. Your input is important. If you are interested in more information, contact the Service at 275 Windsor Street, Room 511, Hartford, CT 06120; 244-2007. ■

Cross Country Skiing

A little peace and quiet

The Department of Environmental Protection wishes to encourage the expansion of cross country skiing as an environmentally sound form of recreation. One of the oldest winter activities known to man, cross country skiing, or ski touring, has enjoyed an enthusiastic revival and new growth in Connecticut during the past few years.

As downhill (Alpine) ski areas become more congested and equipment more expensive, more and more people are discovering this inexpensive and extremely enjoyable activity. Ski touring has many advantages, including low initial investment, minimum recurring expense, easy access to usable areas, and the enjoyment of peace and quiet.

Basic ski touring equipment consists of a pair of narrow skis (generally 2" to 2 1/4" wide and weighing from three to six lbs., depending on the skier's experience and degree of proficiency), pin-type bindings, good lightweight touring boots, and ski poles of the proper length (reaching to the armpits while standing upright). Advice on equipment may be obtained from dealers or from any of the many skiers' organizations in the state.

Clothing for cross country skiing should be loose fitting to allow maximum freedom of movement. Layers of clothing should be worn to avoid the problems created by clothes that are too light or too heavy. A lightweight pack, including first aid kit, matches, and other emergency supplies, is highly recommended. Including a wind breaker or sweater in the pack can also provide the means for adapting to changing weather conditions.

General outdoor safety precautions should always be observed: No individual should try cross country skiing alone and even small groups should be sure to notify friends or relatives of their route and planned schedules.

Recommended Areas:

There are no basic restrictions that would prohibit cross country skiing in any of Connecticut's state parks or forests. The skier should become familiar with the area, however, and definitely be aware of other permitted recreational uses. Most state forests are open to hunting during part of the cross country skiing season. Snowmobiling is permitted on specially designated trails in certain state forests. Parking facilities should also be considered when planning ski-touring activities.

Where To Cross Country Ski In Connecticut

The Department of Environmental Protection lists areas, administered by the department, which offer terrain suitable for cross country skiing in Connecticut.

The trails are not groomed and usually no parking or other facilities are provided. There is no fee for use of the areas which are listed by DEP district.

EASTERN DISTRICT
209 Hebron Rd.,
Marlborough, CT 06447
295-9523

Bluff Point State Park
Groton
Cockaponset State Forest
Haddam
Gay City State Park
Bolton
Haddam Meadows State Park
Haddam
Haley Farm State Park
Groton
Hurd State Park
East Hampton
James L. Goodwin State Forest
Hampton
Mansfield Hollow State Park
Mansfield
Mashamoquet Brook State Park
Pomfret
Meshomasic State Forest
Portland
Mohegan State Forest
Scotland
Natchaug State Forest
Eastford
Nathan Hale State Forest
Coventry
Nye Hollman State Forest
Tolland

Pachaug State Forest
Voluntown
Rocky Neck State Park
East Lyme
Salmon River State Forest
Colchester
Shenipsit State Forest
Stafford
Wadsworth Falls State Park
Middlefield

WESTERN DISTRICT
R.F.D. #4, Plymouth Rd.,
Harwinton, CT 06791
485-0226

American Legion State Forest
Barkhamsted
Black Rock State Park
Watertown
Burr Pond State Park
Torrington
Collis P. Huntington State Park
Redding
Dennis Hill State Park
Norfolk
Dinosaur State Park
Rocky Hill
Hall Meadow State Park
Torrington
Housatonic Meadows State Park
Sharon
Macedonia Brook State Park
Kent
Nepaug State Forest
New Hartford
Osbornedale State Park
Derby
Penwood State Park
Bloomfield
Seth Low Pierrepont State Park
Ridgefield
Southford Falls State Park
Southford
Squantz Pond State Park
New Fairfield
Stratton Brook State Park
Simsbury
Sunnybrook State Park
Torrington
Topsmead State Forest
Litchfield
Tunxis State Forest
Hartland
Wittemore Glen State Park
(Larkin State Bridle Trail)
Oxford (5 towns)

* * *

Pennsylvania pigeons are literally burning their bridges behind them, reports National Wildlife magazine. Apparently, pigeon droppings mix with rain to form acids potent enough to eat through steel girders. According to state bridge engineer Jerry Jackson, over several decades the droppings rot the steel, weakening structures to the point where a weight limit must be imposed or the bridges closed altogether. ■

According to the aluminum industry, more than half the aluminum cans produced in the United States are eventually recycled, reports International Wildlife magazine. Recycling is said to be so efficient that a can coming out of a store is back on the shelf within six weeks. ■

Squirrels

From page 9

squirrels occasionally occupy attics or caves, particularly where nut trees are nearby. The favored nest site is an abandoned woodpecker cavity, but they will also build nests in the hollow limbs of dead trees. Occasionally, a flying squirrel will move into an unoccupied bird house.

They are sociable creatures and are active throughout the year. During cold snaps, they remain in a nest, sometimes grouped together for warmth like the other two squirrels. They breed twice during the year, litters appearing in spring and summer. The tiny, helpless young grow rapidly, doubling their size within the first week of life. They are usually weaned at the end of five to six weeks, although they remain as a family group until the next litter is born. A female with young is an aggressive defender of her territory.

The diet of a flying squirrel includes many nuts, seeds, berries, tree buds, and also sunflower seeds and corn, if available. They also consume insects, eggs and small birds. They store food right in the nest and will also bury food. Although flying squirrels are thought to spend little time on the ground, they do forage and feed among the forest litter.

A near look-alike of the southern flying squirrel is the northern flying squirrel, Glaucomys sabrinus, which is considered rare in Connecticut. The northern flying squirrel is larger and darker than its southern counterpart. Northern Connecticut is at the southern limit of its range and only a few specimens have been positively identified. Its secretive ways and nocturnal habits combine to make determination of its presence difficult. Thus, its status as a Connecticut mammal is poorly understood.

Although it is unlikely that any of us will see a flying squirrel this winter, both red squirrel and gray squirrel are easy to observe, and, for this reason, are ideal subjects for study. Squirrel-watching can be an entertaining pursuit, one that can be done from park bench or living room window. One may begin to recognize an individual squirrel through its behavior and appearance and perhaps see young ones when they first venture forth with their mothers. ■

Folds of skin spread out and enable the flying squirrel to glide for long distances.

For Some Species Giving Life Results in Death

For some species in the animal kingdom, the act of reproduction is their final purpose. The effort to give new life means that their lives must end.

Species such as the salmon in North America, Australia's marsupial mouse, and the enchanting monarch butterfly engage in "semelparity," meaning they reproduce only once.

Semelparity has a purpose, says University of Arizona professor William Shaffer. Some species, he says in the current issue of National Wildlife, create more descendants because they put all their energy into one reproductive episode.

Take the salmon which, after living to maturity in the sea, begins a remarkable quest for its "once in a lifetime" reproductive episode. They migrate as many as 2000 miles, often against strong river currents and past a variety of predators including fishermen, to the place of their birth. Once there, the female digs a shallow bed in gravel and then deposits a few thousand eggs that are fertilized and covered over. In a few days, the female is dead.

Sometimes the animal kingdom doesn't fare well when a plant species goes through a generational change, according to the article in the National Wildlife Federation's bimonthly publication. A modern-day catastrophe is in the making in China where entire forests of bamboo -- the staple diet of the rare panda -- are withering during a once-in-80-years die-off that is necessary to provide energy for seeds to grow the next forest. The result is that the pandas face mass starvation.

The male Australian marsupial mouse is the only mammal known to die after reproducing. The nocturnal mouse, which looks like a miniature rat, becomes senile after a flurry of mating. Its thick fur turns dull and thin and it weakens. Within a month, when the females have given birth, the adult male mice are dead, while females usually live and even reproduce again.

Monarch butterflies spend winters in Mexico and wait for an instinctual signal to migrate north. Most male monarchs die along the way, but the female completes the migration and lays hundreds of egges. Her task in life is complete, and she promptly dies.

The agave, a fleshy succulent plant that thrives in the deserts of Arizona and Mexico, is a semelparous plant. The agave may live 100 years but will not bloom throughout most of its life. Finally the agave will grow a center stalk up to 50 feet in length before it dies.

"Some studies," says National Wildlife, "suggest that the higher the stalk, the more pollinators the agave will attract in that one spectacular reproduction episode."

Pine Acres Lake Lowered

Dennis P. DeCarli, Deputy Commissioner of the Department of Environmental Protection, announced that Pine Acres Lake, in Hampton, is being partially drained during the winter to improve fish and wildlife habitat.

"The purpose of bringing the pond to a lower level for the winter is to cut down on aquatic vegetation," said Charles Phillips, Fish Biologist for the Department of Environmental Protection. "Floating vegetation of little fish or waterfowl value has become extremely heavy during the past year. We expect to kill some of it with this management technique." According to Phillips, water weeds such as milfoil and bladderwort provide minimal food of value to wildlife, seriously interfere with fishing, and, when decaying, use up oxygen in the water needed by fish and other water life.

Weed reduction should improve the canoeing at Pine Acres Lake. "When the weeds are under control, the pond offers an exceptionally interesting area for paddlers, with opportunities for the amateur marine botanist, heron-watcher, and turtle-lover," said Lois Kelley, Director of the Goodwin Conservation Center. "Canoeists during the past summer found the going extremely difficult due to the weedy conditions."

Although Pine Acres Lake is relatively large in area, some 200 acres, it is a shallow pond, averaging less than three feet in depth. Lowering the water level only a few feet exposes large areas of the pond bottom to winter cold. Freezing of the soil kills many of the undesirable pond weeds that otherwise survive the winter under water. During 1981 and 1982 Pine Acres Lake was drained to allow extensive repairs to the dam and spillway. According to DeCarli, it will take several years to reach a balance between the weeds and the need to keep the pond at its maximum water level. "Without control," said DeCarli, "the lake would become a plant-choked swamp."

Release of water from the pond has already begun, according to Phillips. Weir boards are being removed gradually until the water level reaches a point three feet below normal, and this lesser depth will be maintained through the winter. At the end of February, the weir boards will be replaced so that snow melt and spring rains can be contained, with full refill anticipated before the opening of fishing season.

The lowering of the pond as a weed management technique was discussed and approved by all sections of the Department of Environmental Protection, and was chosen as preferable over the use of herbicides. ■

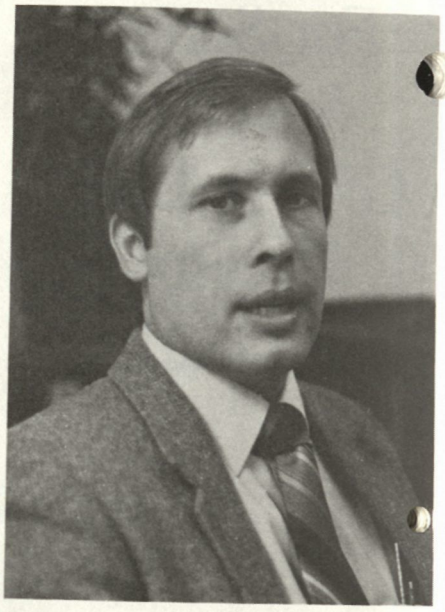
Charles Reed to Head DEP Land Unit

Stanley J. Pac, Commissioner of the Department of Environmental Protection, announced that Charles Reed will fill the vacant position of Director of Land Acquisition and Management starting Monday, November 19.

"Connecticut is fortunate," Pac said, "to have found a candidate as well-qualified as Charles Reed for his very critical position. Mr. Reed has excellent credentials, including an advanced degree in resource management, experience as a Land Acquisition Officer and most recently five years as Chief of Grants for the Virginia Division of Parks and Recreation."

DEP's Land Acquisition and Management Unit is responsible for the acquisiion of land for department use, management of state-owned land under department control, the administration of a grant-in-aid program to provide assistance to municipalities, and advising state and local officials on related subjects.

"Land acquisition and management activities are vital to the functioning of this deparment," Pac said. "I am very pleased to have Mr. Reed undertake the management of these activities. I am, in fact, very pleased with the caliber of all the candidates for this position." ■



Robert Paier

Charles Reed, Director of Land Acquisition and Management.

Trailside Botanizing

American Yew

By G. Winston Carter

American yew, or ground hemlock, is probably best known as a popular ornamental. It is commonly used as a ground cover in areas that are moist and shady.

In its natural habitat, it grows as a low, straggling shrub, forming clumps with numerous spreading branches. The flat needles, or leaves, resemble Canadian hemlock; however, the needles of hemlock are shorter and are white on the underside. Yew needles are lighter green on the underside and have an abrupt point at the end.

This species usually grows to a height of about three feet, but on rare occasions may reach a height of six feet. It grows in rocky woodland and ravines, often in association with other evergreens. The flowers of American yew are quite small, particularly the female flower. Male and female flowers are on separate trees and bloom from April to May. The fruit is a conspicuous red, translucent, fleshy berry called an aril. It contains a single, hard, nut-like seed which is unprotected at the top. The yews are the only plants that have this type of fruit.

The seeds and foliage of yew are poisonous when eaten by man but many birds such as ruffed grouse, mocking birds, wood thrush, and some sparrows enjoy the fruit. They swallow the seeds which pass out of the body undigested. Yews are also valuable as cover for early nesting birds.

Deer browse on the foliage and are apparently unharmed when they eat only small amounts, but large amounts are very poisonous to both wild and domesticated animals. Both American and English yew contain an alkaloid called taxine. This weakens the heart, causing sudden death.

The American Indian made use of white cedar and yew leaves to produce medicines for sweat baths, used in the treatment of rheumatism, paralysis, and numbness. ■

Book Review

An American Indian Cookbook: recipes and an insight into a culture

By Martha Kelly, Environmental Intern

Traditional American cuisine has roots in the cooking done by the American Indian. In terms of both the foodstuffs used and the methods of preparation employed, our culinary debt to native Americans is enormous. Barbeques and clambakes, Boston baked beans, Brunswick stew, and baked apples are examples of dishes stemming from a truly American tradition of food preparation.

In Native Harvests: Recipes and Botanicals of the American Indians, Barrie Kravasch explores the imaginative uses the Indians found for a wide variety of wild and cultivated foodstuffs. The cookbook is an outgrowth of her research in ethnobotany and is an expansion of the first edition of Native Harvests, which was prepared under the auspices of the American Indian Archeological Institute, in Washington, Connecticut.

Hundreds of authentic recipes offer modern cooks a wealth of native creativity. Many of the foods are familiar ones for, as Kravasch points out, almost 75 percent of our present foodplants originated in the New World and formed the diet of the indigeneous peoples for centuries before the arrival of the Europeans. Early native cultures domesticated and hybridized such food staples as corn, beans, and potatoes from the wild.

Succotash, Indian pudding, and cranberry sauce are presented in versions which include natural flavorings or sweeteners instead of refined products. Other recipes use familiar foods in imaginative ways; sunflower seed soup, wild rice with hazelnuts and blueberries, and pumpkin-hickory cakes are examples. Some recipes illustrate the use of foods and seasonings available only to the forager who has gathered them from the wild. Many suggestions are offered for the substitution of more mundane ingredients when the wild foodstuff is not available.

Besides its value as a cookbook, this attractive volume offers information essential to those interested in foraging. It is illustrated with Kravasch's skillful drawings of more than a hundred wild plants, plus it includes botanical charts listing the harvest season and plant parts used of dozens of species. These features and a reference guide to further reading make it a valuable adjunct to trail or identification guides.

Native Harvests goes far beyond the bounds of a typical cookbook; its recipes are supplemented by chapters of interest to the herbalist on wild seasonings, medicines and cosmetics, and smoking mixtures. Throughout the volume, cautions are included regarding those plants or plant parts which may be toxic. Tips for safe foraging are summed up in a chapter on poisonous wild plants.

Whether you are a cautious cook or an adventurous forager, Native Harvests will entertain you as it expands your appreciation of the natural world and the ingenuity of America's indigenous peoples. It is available in the gift shop of the American Indian Archeological Institute, or by mail from AIAI, P.O. Box 260, Washington, Ct., 06793. Hardcover, $10.00; paper, $5.95; plus Ct. sales tax and postage/handling charge of $1.50. Purchase of the book supports the permanent ethnobotany research fund of the AIAI. ■

The Alaskan moose is possibly the largest antlered animal ever to live on Earth, says National Wildlife magazine. Its rack can exceed six feet in width.

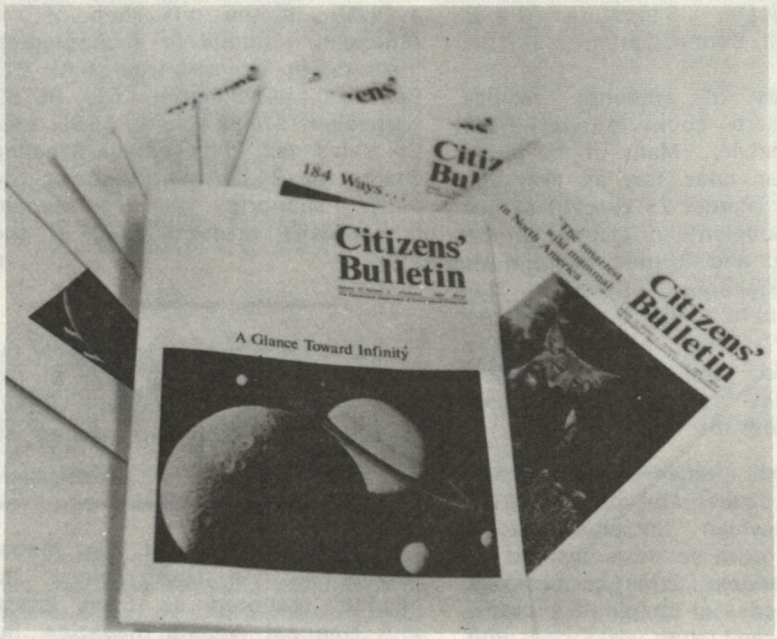
As late as the Civil War, moose ranged as far south along the Atlantic seaboard as Long Island, says National Wildlife magazine. But by 1880 they had vanished throughout New York and southern New England because of habitat loss. Today, the moose is most commonly seen in Maine but, on occasion, a half-ton moose has brought traffic to a screeching halt in downtown Worcester, Massachusetts.

Endnote

"The ultimate test of Man's conscience is his willingness to sacrifice something today for a future generation whose words of thanks will not be heard."

Gaylord Nelson

Address to the 11th Annual Conference of the National Association for Environmental Education, October 19, 1982.



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